

AMENDMENTS TO THE CLAIMS

Please amend Claims 1, 5, 14, and 24 as follows, without prejudice or disclaimer to continued examination on the merits:

1. (Currently Amended): A method of managing distributed statistical data retrieval in a network device, comprising:

a. gathering statistical data on at least one card within the network device periodically, wherein, upon each start, upgrade, or reboot, a device driver on the at least one card informs a usage data monitoring library on the at least one card which statistical data the device driver is able to gather;

b. sending a predetermined number of packets from the card to a central process, wherein one of the predetermined number of packets is a registration packet comprising one or more string names corresponding to the types of statistical data that the usage data monitoring library will send to the central process, wherein each packet includes at least a portion of the statistical data, and wherein the predetermined number of packets is determined via a negotiation between the card and the central process upon a registration of the card with the central process;

c. sending an acknowledge request to the central process in conjunction with sending the last packet in the predetermined number; and

d. controlling the number of packets sent from the card to the central process, including:

    sending an acknowledge packet from the central process to the card indicating a time that the card can resume sending packets to the central process, said time being based on an estimate of a time interval needed by the central process to process a sufficient number of the received packets to reduce the number of packets awaiting processing below a predetermined threshold, wherein the controlling the number of packets sent from the card to the central process load balances the statistical data across

a control plane, smoothes out control plane bandwidth utilization, and reduces data buffering and data loss,

repeating steps b, c and d when the acknowledge packet is received at the card and the time indicated has elapsed.

2. (Original): The method of claim 1, wherein sending an acknowledge request to the central process in conjunction with sending the last packet in the predetermined number, comprises:

    sending the acknowledge request embedded within the last packet in the predetermined number.

3. (Original): The method of claim 1, wherein sending an acknowledge request to the central process in conjunction with sending the last packet in the predetermined number, comprises:

    sending the acknowledge request in an acknowledge request packet separate from the last packet in the predetermined number.

4. (Original): The method of claim 1, wherein sending an acknowledge packet from the central process to the card, comprises:

    detecting an acknowledge request at the central process in a packet received from the card, and

    sending the acknowledge packet to the card from the central process.

5. (Currently Amended): A method of managing distributed statistical data retrieval in a network device, comprising:

    a. gathering statistical data on at least one card within the network device periodically, wherein, upon each start, upgrade, or reboot, a device driver on the at least one card informs a usage data monitoring library on the at least one card which statistical data the device driver is able to gather;

b. sending a predetermined number of packets from the card to a central process, wherein one of the predetermined number of packets is a registration packet comprising one or more string names corresponding to the types of statistical data that the usage data monitoring library will send to the central process, wherein each packet includes at least a portion of the statistical data, and wherein the predetermined number of packets is determined via a negotiation between the card and the central process upon a registration of the card with the central process;

c. sending an acknowledge request to the central process in conjunction with sending the last packet in the predetermined number; and

d. controlling the number of packets sent from the card to the central process, including:

sending an acknowledge packet from the central process to the card; and  
repeating steps b, c and d when the acknowledge packet is received at the card,  
wherein sending an acknowledge packet from the central process to the card,  
comprises:

detecting an acknowledge request at the central process in a packet received from the card;

determining a number of packets to be processed by the central process;  
comparing the number of packets to be processed to a predetermined threshold periodically; and

sending the acknowledge packet to the card from the central process when the number of packets to be processed is less than the predetermined threshold, and  
wherein the controlling the number of packets sent from the card to the central process load balances the statistical data across a control plane, smoothes out control plane bandwidth utilization, and reduces data buffering and data loss.

6. (Previously Presented): The method of claim 1, wherein sending an acknowledge packet from the central process to the card further comprises:

detecting an acknowledge request at the central process-in a packet received from the card;

determining a number of packets to be processed by the central process;

comparing the number of packets to be processed to a predetermined threshold; and

estimating when the number of packets to be processed will be below the predetermined threshold.

7. (Original): The method of claim 6, wherein if the number of packets to be processed is below the predetermined threshold, then the indicated time is immediately.

8. (Original): The method of claim 1, wherein gathering statistical data on at least one card within the network device periodically, comprises:

gathering a current statistical data sample on the card periodically at a first period.

9. (Original): The method of claim 8, wherein gathering statistical data on at least one card within the network device periodically further comprises:

adding the current statistical data sample to a data summary each time the current statistical data sample is gathered.

10. (Original): The method of claim 9, wherein sending packets from the card to a central process comprises:

sending packets containing at least a portion of the current statistical data sample from the card to the central process periodically at a first period; and

sending packets containing at least a portion of the data summary from the card to the central process periodically at a second period.

11. (Original): The method of claim 10, wherein, in normal operation, the second period is longer than the first period.

12. (Previously Presented): The method of claim 1, wherein the card is a first card and the statistical data is first statistical data and wherein the method further comprises:

e. gathering second statistical data on a second card within the network device periodically;

f. sending the predetermined number of packets from the second card to the central process, wherein each packet includes at least a portion of the second statistical data;

g. sending an acknowledge request to the central process in conjunction with sending the last packet in the predetermined number; and

h. controlling the number of packets sent from the second card to the central process, including:

    sending an acknowledge packet from the central process to the second card; and  
    repeating steps f, g and h when the acknowledge packet is received at the second card.

13. (Previously Presented): The method of claim 1, wherein the statistical data is first statistical data and wherein the method further comprises:

e. gathering second statistical data on the card periodically;

f. sending the predetermined number of packets from the card to the central process, wherein each packet includes at least a portion of the second statistical data;

g. sending an acknowledge request to the central process in conjunction with sending the last packet in the predetermined number; and

h. controlling the number of packets including a portion of the second statistical data sent from the card to the central process, including:

    sending an acknowledge packet from the central process to the card; and

    repeating steps f, g and h when the acknowledge packet is received at the card.

14. (Currently Amended): A method of managing distributed statistical data retrieval in a network device, comprising:

a. gathering statistical data on a plurality of cards within the network device periodically, wherein, upon each start, upgrade, or reboot, a device driver on at least one card informs a usage data monitoring library on the card which statistical data the device driver is able to gather;

b. sending a predetermined number of packets from each card to the central process, wherein one of the predetermined number of packets is a registration packet comprising one or more string names corresponding to the types of statistical data that the usage data monitoring library will send to the central process, wherein each packet includes at least a portion of the statistical data, and wherein the predetermined number of packets is determined via a negotiation between the card and the central process upon a registration of the card with the central process; and

c. sending an acknowledge request from each card to the central process in conjunction with sending the last packet in the predetermined number; and

d. controlling the number of packets sent from the cards to the central process, including:

    sending an acknowledge packet from the central process to each card indicating a time at which the card can resume sending packets to the central process, said time being based on an estimate of time a interval needed by the central process to process a sufficient number of the received packets to reduce the number of packets awaiting processing below a predetermined threshold, wherein the controlling the number of packets sent from the card to the central process load balances the statistical data across a control plane, smoothes out control plane bandwidth utilization, and reduces data buffering and data loss; and

    repeating steps b, c and d when the acknowledge packet is received at each card and the time indicated has elapsed.

15. (Original): The method of claim 14, wherein sending an acknowledge request from each card to the central process in conjunction with sending the last packet in the predetermined number, comprises:

    sending the acknowledge request from each card embedded within the last packet in the predetermined number.

16. (Original): The method of claim 14, wherein sending an acknowledge request from each card to the central process in conjunction with sending the last packet in the predetermined number, comprises:

    sending the acknowledge request from each card in an acknowledge request packet separate from the last packet in the predetermined number.

17. (Original): The method of claim 14, wherein sending an acknowledge packet from the central process to each card, comprises:

    detecting an acknowledge request at the central process in a packet received from one of the cards; and

    sending the acknowledge packet to that card from the central process.

18. (Original): The method of claim 14, wherein sending an acknowledge packet from the central process to each card, comprises:

    detecting an acknowledge request at the central process in a packet received from one of the cards;

    determining a number of packets to be processed by the central process;

    comparing the number of packets to be processed to a predetermined threshold periodically; and

    sending the acknowledge packet to that card from the central process when the number of packets to be processed is less than the predetermined threshold.

19. (Previously Presented): The method of claim 14, wherein sending an acknowledge packet from the central process to each card, comprises:

detecting an acknowledge request at the central process in a packet received from one of the cards;

determining a number of packets to be processed by the central process;

comparing the number of packets to be processed to a predetermined threshold;

estimating when the number of packets to be processed will be below the predetermined threshold; and

sending the acknowledge packet from the central process to the card indicating a time that that card may resume sending packets to the central process.

20. (Original): The method of claim 14, wherein gathering statistical data on a plurality of cards within the network device periodically, comprises:

gathering a current statistical data sample on each card periodically at a first period.

21. (Original): The method of claim 20, wherein gathering statistical data on a plurality of cards within the network device periodically further comprises:

adding the current statistical data sample to a data summary on each card each time the current statistical data sample is gathered.

22. (Original): The method of claim 21, wherein sending a predetermined number of packets from each card to the central process comprises:

sending packets containing at least a portion of the current statistical data sample from each card to the central process periodically at a first period; and

sending packets containing at least a portion of the data summary from each card to the central process periodically at a second period.

23. (Original): The method of claim 22, wherein, in normal operation, the second period is longer than the first period.

24. (Currently Amended): A method of managing distributed statistical data retrieval in a network device, comprising:

gathering a plurality of different types of statistical data on at least one card within the network device periodically, wherein, upon each start, upgrade, or reboot, a device driver on the at least one card informs a usage data monitoring library on the at least one card which statistical data the device driver is able to gather; and

sending groups of packets from the card to a central process at staggered times, wherein each group of packets includes one of different types of statistical data wherein the staggered times are determined by a plurality of polling timers, each corresponding to one of said statistical data types, wherein one of the packets is a registration packet comprising one or more string names corresponding to the types of statistical data that the usage data monitoring library will send to the central process, and wherein a size of each of the groups of packets is determined via a negotiation between the card and the central process upon a registration of the card with the central process; and

wherein the sending groups of packets from the card to a central process at staggered times load balances the statistical data across a control plane, smoothes out control plane bandwidth utilization, and reduces data buffering and data loss.

25. (Original): The method of claim 24, wherein gathering a plurality of different types of statistical data on at least one card, comprises:

gathering each of the different types of statistical data at a different time.

26. (Canceled)